A SIMPLIFIED HOLDER FOR EUMENID NESTING BLOCKS (HYMENOPTERA: EUMENIDAE)[1,2]

Judith A. Collins[3], Daniel T. Jennings[4]

ABSTRACT: Materials and construction of a simple, inexpensive holder for eumenid nesting blocks are described.

Many species of solitary wasps (Hymenoptera: Eumenidae) nest in hollow stems and cavities constructed by wood-boring insects. Foundress female wasps also accept and provision predrilled blocks of wood as nesting sites. Numerous investigators have designed and successfully used trap blocks for collecting eumenid wasps (Cooper 1953; Fye 1965a; Medler and Fye 1956; Krombein 1967), and bees (Parker and Bohart 1966). Koerber and Medler (1958) used bundles of sumac stems held together with rubber inner-tube bands. Fye (1965b) developed several methods for placing trap nests in elevated locations. Although trap blocks are not identical to natural nesting sites, they are very useful for collecting and studying eumenid wasps in forest and nonforest habitats.

Most trap designs consist of a bundle of predrilled blocks held together with rubber bands. A solid piece of wood usually is added to facilitate attachment of a wire hanger. The rubber bands frequently stretch and break with prolonged use. This paper describes a simple but effective method of binding and hanging nesting blocks.

MATERIALS

The materials needed for trap and holder construction are readily available at most hardware and fabric stores. Each trapping unit consists of: 1) a bundle of predrilled blocks (usually 9 or 12), 2) a hanging board, 3) a wire hanger, 4) four fastening staples, and 5) two non-roll ribbed elastic bands (Fig. 1).

Our trap blocks were cut from straight-grained eastern white pine, *Pinus strobus* L. Each block was 2 x 2 x 18 cm with a central hole, 8 mm in

diameter, bored to a depth of 14.9 cm. We used a twist drill for boring holes. Blocks should be straight-grained and free of knots to allow easy splitting and study of nests.

The hanging board is a solid block of wood; common "strapping" is sufficient. Our board was 2 x 6 x 18 cm for a nine-block bundle. The size may vary depending on the number of blocks per bundle. The board should completely cover the top row of nesting blocks.

The hanging wire consists of a wire coat hanger. The botton half of the hanger is cut off about 14 cm below the twisted neck. Pliers are used to bend the cut ends so that they are pointing outward. The hanger is fastened to the center of the hanging board with four #9 double-pointed wood staples, two at each end. For convenience, the hook above the neck of the coat hanger may be cut off; the twisted neck serves as a hanging point.

The bundle of nesting blocks is held together with two pieces of 3/4 inch (1.9 cm) non-roll ribbed elastic, such as used in waistbands of various garments. Each piece, 23 cm long, is formed into a loop with the ends overlapping 2.5-3.0 cm. The ends are sewn together with heavy-duty nylon
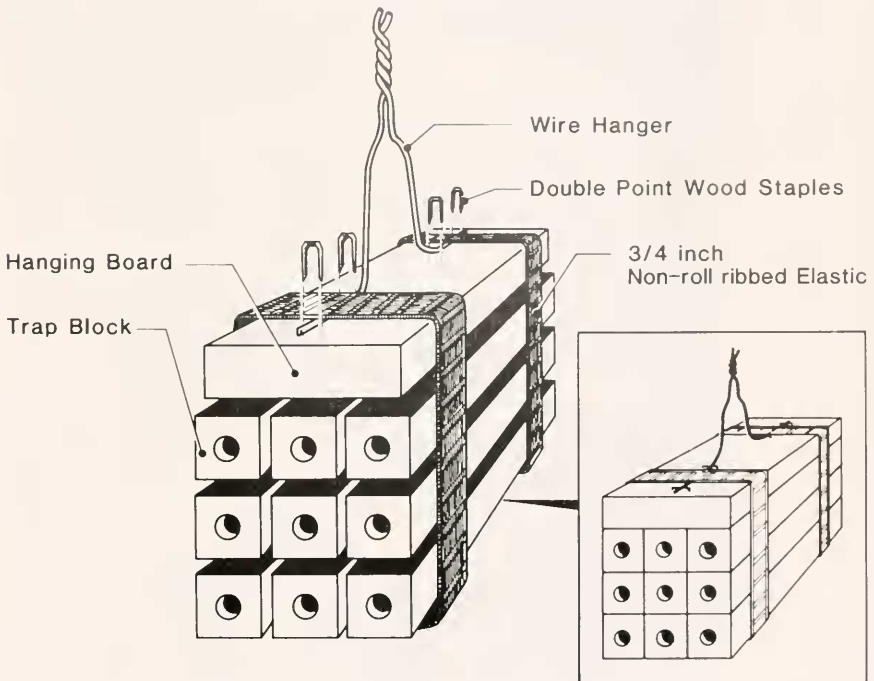

Fig. 1. Design of a simplified holder for eumenid nesting blocks.

Fig. 2. Field placements of trap-nesting bundles in a spruce-fir forest; a) tree-mounted, b) stake-mounted, c) on logging slash.

thread, and for added strength, the ends are oversewn two or three times. Loop size is dependent on bundle size. The elastic bands should be tight enough to hold the blocks firmly together, but also allow easy removal and replacement of nesting blocks.

DISCUSSION

The trap nest holder we describe is simple, easily constructed and relatively inexpensive. Nesting block sizes, numbers of blocks per bundle, diameter and depth of borings, and deployment sites may vary depending on study objectives. Bundles of blocks may be hung from live or dead trees (Fig. 2a); from stakes (Fig. 2b); or from logging slash and debris near the ground (Fig. 2c).

Blocks that have been provisioned by the wasps (i.e., entrance holes sealed with mud plugs) can be removed and replaced with new, unused blocks. Provisioned blocks are taken to the laboratory where they are split with a chisel and rubber mallet. Block contents are examined and reared in situ (Krombein 1967); or, the contents (wasp egg, larva, or pupa and prey) are removed and reared separately in 4-dram shell vials (Jennings and Houseweart 1984).

The elastic bands usually last for one collecting season (4 months). Under rigorous and continued use, the elastic stretches and no longer holds the nesting blocks firmly together. However, the non-roll ribbed elastic is more durable than ordinary rubber bands which readily stretch and crack in open sun.

These trap nesting blocks and holders have been used successfully to determine the species of eumenid wasps preying on spruce budworm, *Choristoneura fumiferana* (Clemens), and other lepidopterous larvae in spruce-fir forests of Maine.

LITERATURE CITED

Cooper, K.W. 1953. Biology of Eumenine Wasps. I. The ecology, predation, and competition of *Ancistrocerus antilope* (Panzer). Trans. Amer. Ent. Soc. 79: 13-35.

Fye, R.E. 1965a. The biology of the Vespidae, Pompilidae, and Sphecidae (Hymenoptera) from trap nests in northwestern Ontario. Can. Entomol. 97: 716-744.

Fye, R.E. 1965b. Methods of placing wasp trap nests in elevated locations. J. Econ. Entomol. 58: 803-804.

Jennings, Daniel T., and Mark W. Houseweart. 1984. Predation by eumenid wasps (Hymenoptera: Eumenidae) on spruce budworm (Lepidoptera: Tortricidae) and other

lepidopterous larvae in spruce-fir forests in Maine. Ann. Entomol. Soc. Am. 77: 39-45.

Koerber, T., and J.T. Medler. 1958. A trap nest survey of solitary bees and wasps in Wisconsin, with biological notes. Proc. Wisconsin Acad. Sci. Arts and Lett. 47: 53-63.

Krombein, Karl V. 1967. Trap nesting wasps and bees: life histories, nests, and associates. Smithsonian Press, Washington, D.C. 570 pp.

Medler, J.T., and R.E. Fye. 1956. Biology of *Ancistrocerus antilope* (Panzer) (Hymenoptera, Vespidae) in trap nests in Wisconsin. Ann. Entomol. Soc. Am. 49: 97-102.

Parker, F.D., and R.M. Bohart. 1966. Host-parasite associations in some twig-nesting Hymenoptera from western North America. The Pan-Pacific Entomologist 42: 91-98.

MEMOIRS OF THE AMERICAN ENTOMOLOGICAL SOCIETY

A SERIES OF MONOGRAPHICS PAPERS BY STUDENTS OF AUTHORITY IN THEIR RESPECTIVE SUBJECT.
CURRENTLY AVAILABLE NUMBERS LISTED BELOW.

18. The Genus *Bucculatrix* in America North of Mexico (Microlepidoptera). Annette F. Braun. 1963. $15.00.
19. The Butterflies of Libera. Richard M. Fox, Arthur W. Lindsey, Jr., Harry K. Clench and Lee D. Miller. 1965. $12.50.
20. A Revision of the Mexican and Central American Spider Wasps of the Subfamily Pompilinae (Hymenoptera: Pompilidae). Howard E. Evans. 1966. $12.50.
21. A Taxonomic and Zoogeographic Survey of the Scarabaeinae of the Antilles (Coleoptera: Scarabaeidae). Eric G. Matthews. 1966. $5.00.
22. A Monograph of the Ithomiidae (Lepidoptera) Part III. The Tribe Mechanitini Fox. Richard M. Fox. 1967. $9.00.
23. A List of New North American Spiders, 1940-1966. Beatrice R. Vogel. 1967. $9.00.
24. The Higher Classification, Phylogeny and Zoogeography of the Satyridae (Lepidoptera). Lee D. Miller. 1968. $7.00.
25. The Schizopteridae (Hemiptera: Heteroptera) With the Description of New Species from Trinidad. Michael G. Emsley. 1969. $6.50.

DOMESTIC   — Postage is charged on all domestic orders unless payment accompanies order
FOREIGN   — Add $1.50 for postage on all foreign orders. Payment must accompany order

20% Discount for Society Members

When ordering copies of above publications, write to:

The American Entomological Society
1900 Race Street
Philadelphia, PA 19103